Diet in Body Maintenance and Curing

261 262 753 Because food created fire, the daily diet could be a source of illness or a therapeutic means. Every food had known properties for heating or cooling, and for other effects as well. Guava fruit, alcohol, and turtle or cobra curry were heating. Eggs were cooling. Depending on the occasion, ice and iced concoctions were over-heating or over-cooling. They were always "dangerous during menstruation." Banana varied according to the variety: kluāi hōm (fragrant banana) was undesirably cooling and caused either diarrhea or constipation (Hauck, 1959:27); kluāi nam wā was less deleterious (salāeng) while kluāi nam was good for the sick or for parturients (Boonlong).

252 262 Properties in food changed in cooking. Boiling made rice "ripe" (auk) and so available as nourishment (Anuman Rajadhon:77). Even the method of cooking varied the properties. For the sick and for parturients, the banana [758] variety called kluāi hak muk was good if baked, but not if [846] cooked in syrup (Boonlong).

262 753 827 Some foods were "incompatible" with, and so aggravated, certain illnesses. Air-borne food in the form of smell was incompatible with, and compounded, a condition of wind excess. Death or blindness ensued. On the other hand, asafetida might be tied to the wrist of a new-born baby so that the smell, an established carminative, might cure the excess wind in his stomach manifested as flatulence.

262 Beneficial foods were encouraged. Of all these none surpassed rice, the main sustenance of the body, "the only true food" (Yong Chutima, in Hauck, 1959:27) and source of "strength" to the farmer. Rice was a safe food. It never disturbed elements. Eating rice, as compared with meat, [774] had no overtone of taking life. One could eat one's fill without any sin. Most of all, rice nourished the human khwan, for each grain contained a part of the khwan of the [782] divine Rice Mother. Furthermore, any food offered ritually to a spirit or to make merit acquired strengthening properties, and was afterwards given to priests, children, or to the sick.

Foods with known dangers were avoided. "Kluāi tānī [776] banana, a variety full of seeds, was never eaten because it contained a female ghost (phī)." Jackfruit was avoided by lactating women as a direct source of wind-excess. Fruit in general was not dangerous but "did not give enough strength for a rice farmer. It was all right for an orchardist."

562 delivery, "her blood was purified to a white color to become
[827] the milk of the breast."[48] Nursing a child was the essence
[853] of a woman's function, the supremely feminine act. A priest said, "A mother mercifully receives the khwan into her womb, and for maintaining life gives more of her own body, strength, and care (i.e. than does the father). Mothers are born to love children. Theirs is a steady intent to provide children with successful existences. To a mother one is most grateful" (S.S.).

562 In a wider context, not only all their household members
462 but people anywhere were the objects of women's nurture:
252 women were in charge of the cooking even if occasionally
264 helped by men. At the meals they prepared they were often the last to eat, so often "holding back and eating whatever was left over," that in a poor houshold, short rationing daily was probable (Hauck, et al.:35,49). One old lady expressed deep satisfaction that she "did not feel hungry
[082] any more." She construed this as proof that she had ample
[431] merit, but it also meant that she was a great donor who gave
[796] continuously and took little. Women usually offered the early morning food to priests in behalf of the family, and they took charge of cooking the immense amount of food served at large ceremonies and temple festivities. When
593 age pushed women past their mature capacities, they returned
888 to the status of recipients. A son said of his senile mother, "She has gone back to being a child" (klap pai pen dek). The son's wife cooked delicacies for her.

562 A desire to give tender care and nourishment was deemed
857 inborn in all women. Although sex was not strongly
[291] differentiated in babyhood,[49] by age 3 a hard-to-handle
[593] skirt was put on a tiny girl, who reacted with vast pride. By 5, girls were helping with cooking and baby tending. Often has an older sister of 9 or 12 been observed patiently feeding her charge the ice cream she longed to eat herself.

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[822] 48. This very phrase was congruent with the colors associated with the khwan. Red or white flags, or pieces of cloth, or puddings (khanom) were required wherever khwan were involved, such as in rice, san phra phūm, and tham khwan ceremonies. Red was an auspicious color, white symbolized innocence and purity.

[856] 49. Anuman Rajadhon reports, though, that at the moment of birth, the child's sex was immediately "adjusted" (Anuman Rajadhon:127).

In addition, strengthening foods like rice and fish, the staples for stout farmers, were stressed. Fruit, "which gave no strength," and vegetables (except for the nursing curry mentioned below) were avoided.

The holy fire also transformed a woman into a better nourisher. It gave her new, lasting beneficial nursing habits. As one man explained, "the very nature of water is changed by boiling over a fire. It becomes suk (ripe)." Similarly, a woman's body, her very nature, was permanently changed to suk by the fire's heating. The fire, in fact, made suk all the food she ate beside it. Since this food was turned into milk, her breast milk became suk and so more nourishing, and did not disturb elements.[52] "Food eaten while lying by the fire, when eaten later on (during lactation) by the mother, does not cause diarrhea in the baby." Jackfruit ordinarily caused wind-trouble during lactation, but one woman ate it during the fire-rest, and at once "got used to it, so she could eat it all the time." To make themselves better nourishers, some women spoke of the desirability of "eating a bit of every kind of food." The "nursing curry" (kaeng lIeng) was a mixture of vegetables.

Finally, the consecrated fire strengthened a woman's own khwan. She could better withstand convulsion if attacked by a spirit.[53] She was able thereby to handle a khwan even without the special magic that existed for it.

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52. To be nourishing even the daily rice had to be made suk by boiling (Anuman Rajadhon:77). It may be that no food was considered nourishing unless suk, either naturally (like ripe fruit) or by cooking.

53. "...when 'involuntarily' entered by ghosts...maidens in the 17-25 age bracket tend to convulse more violently than do women of more advanced years"(Textor:406). "Maidens" were presumably not married and so not suk.

What differences in circumstances existed that might affect nutritional level? On the one hand were relatively isolated nuclear families, which we estimated as 15-20% of the families, living in tiny separate cottages.[1] Usually with inadequate or no land, they earned an irregular income by hiring themselves out for farm or other work. At the other extreme, in a hamlet-like cluster of dwellings, lived a closely affiliated group of kin. A senior couple more or less headed the married sisters, brothers, or children, maybe with a hired man, or family that as autonomous households cooperated amicably in economic and domestic tasks. We estimated these as 20-25% of the Bang Chan families. The larger social unit, having more hands to produce, and to share tasks, was better able to provide good food and general health care to its members, than a small isolated family. Four problems more easily handled by the larger group were household chores and child-care, farming, borrowing, and earning money.

Young children had to be constantly tended lest they fall into the water, the fire, or under the buffalo's feet. They never entered the fields during work. Fishing and gathering of water plants was complicated because in boats, small children had to be held. Where there were but two parents and young children, one parent could not do many things until the other came home. Perhaps neither partner could stay away long enough to get a big batch of fish or greens from the canal, or go to the store. Cooking was simplified, or food might be prepared once a day only. Respite came only when the first born was able to help oversee a younger child, sometimes staying home from school to do so. Where the adult cooperative group was larger, movement was freer. All the strong adults could work in the fields or at a job, confident that the home was well tended. They came home to a well-prepared meal, ready when they wanted it. Such households had more fresh fish because farm work could be completed sooner, hence more persons could devote themselves to fishing. Some physically able members could even be spared and financed to go beyond the required four grades of elementary school.

Plowing could be done by a man and wife, but for both transplanting and harvesting which had to be done within a few days, large groups were necessary. Two patterns of auxiliary group labor prevailed: reciprocal cooperative work, and hiring of labor.

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1. Janlekha, 1955, categorized families as 5% "one-person," 59% nuclear, 8% limited extended (including one or more parents of a spouse), 27% extended (including dependent married couples or other collateral relatives), and the temple residents. At least 32% of the families had inadequate or no land. His figures do not indicate the degree of domestic cooperation which was an ameliorating factor in well-being.

canal misjudged his needs for milled rice and ran out, he had to mill his own paddy. Since the main canal was deepened in 1953, year-round transportation of rice by boat has been possible for many more farmers, and this may further decrease the consumption of home-milled rice.

Of 105 households which had and used a home rice mill, 99 used the polishings for feed but no family in Bang Chan used them for human food (Goldsen and Ralis, 1957). One farmer, headman of a hamlet, who lived near the main canal and the road to Minburi but who used home-milled rice, offered as the reason that the polishings were good chicken feed, and if he took rice to Minburi to be milled, the miller would keep the polishings.

As reported by Janlekha (1955) consumption of milled rice in 106 households amounted to about 285 kilograms per capita per year or 780 grams per person per day. Such "household consumption" includes "losses to pests and poultry, daily gifts to priests, contributions to temples and outlays for feasts and rites in undetermined but considerable amounts" (Sharp et al., 1953, pp. 265-266).

Flesh Foods Other than Fish. - The people of Bang Chan had a taste and appreciation for flesh food, but the production and use of meat was certainly inhibited by Buddhist tenets which prohibited the taking of life.[1] Killing of poultry, fish, etc. was tolerated among the relatively young, but was considered unsuitable to the aged who should be preoccupied with living virtuously. People felt, however, that the sin of taking life was condoned if they offered part of an animal to the priests.

Since many villagers were unwilling to slaughter buffaloes even when they become aged and useless, such animals were commonly kept until they died. Animals which had died of old age or disease were not, however, regarded by Thai Buddhists in Bang Chan as unfit for human consumption. Usually they were cut up and given to the priests. When the buffalo belonging to one family (Household 67)[2] participating in the dietary survey died, some of the meat was used fresh for curry, much

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1. Meat such as water buffalo and pork as well as fish was sold by venders. Since meat was relatively expensive and was usually used in small amounts with other foods, it was offered for sale in chunks which no longer resembled the living animal. Seeing such small quantities spared the sensibilities of the Buddhists who were thus removed a step from the killing. Actual butchering was done by Moslems or Chinese who did not object.

2. Households were identified by numbers assigned by lot.

was given away fresh to selected kin and friends, including those who helped to butchar, and the remainder was salted and dried. Of this, 7 kg. were kept and 5 kg. sold. Moslems are forbidden to eat an animal with two or four legs which "dies," although eating dead locusts or fish is not forbidden. Some Moslems in Bang Chan reported offering dead animals to Buddhists in barter for other materials.

Oxen, a sign of prosperity, were bought as calves by the Moslems and fattened for meat, usually with a ceremony in mind. In 1955 (Goldsen and Ralis, 1957) only 5 householders in Bang Chan raised hogs, and 4 of these had 1 or 2 only. Moslems ate no pork. A permit from the district officer was necessary for slaughtering a buffalo or an ox but not for hogs. Natural deaths of such animals were supposed to be reported.

Poultry was not commonly used for food in Bang Chan. It was the poor man's "feast" food suitable for guests. One couple in the lowest income level killed one chicken or a duck once a year to provide the traditionally good meal for their cooperative harvest helpers. Others, better off, might serve chicken especially at men's dinners. Pigeons were raised for sale in the market by one Moslem family. In 1953-54, one person was trying to raise a few turkeys for sale, as word had reached Bang Chan that turkeys were in demand for foreigners' holiday dinners. By 1957 turkey-raising for cash was spreading, but some villagers objected to having them around "because they look like vultures and bring misfortune."

Various wild creatures were used for food whenever they were caught. Turtle curry was considered a great delicacy, but as turtles, which could be caught from May to February, brought a good price in Bangkok, experts usually sold their catch. Frogs and turtles were sometimes kept in a jar until needed. Eels, frogs, cobra and other snakes were used for curry. Field rats, available all year, were roasted.

Fish. - Next to rice, fish constituted the most abundant food in the diet in Bang Chan. Either fresh or preserved,[1] they were available throughout the year. Killing

1. According to observation in 1952-54, fish caught in excess of immediate needs were preserved for later use. Serpentheads ((1)plaa (3)chauaun), which are about 7 or 8 inches long, and pilot fish ((1)plaa (2)sa-(2)lid), about 4 or 5 inches long, were commonly salted and dried. Heads and tails were removed and the fish were split open and salted overnight. The following morning the fish were washed and spread on fiber trays in the sun to dry. Some excess fish might be dried at anytime of year, but larger quantities were done during the hot, dry season. The process was usually complete within a week.

listed on 10 or more of the 24-hour dietary records obtained. For items which were major ingredients, the number of records on which the item appeared, is given.[1] Thus (1)plaa (1)thuu, which is bought by residents of Bang Chan during the busy work seasons, was used more often than any other single variety of fish named. Of the varieties caught locally, climbing perch, serpenthead, and silurus were most commonly used. Fermented fish, not included in the calendar, appeared on 53 records, and fish with kind not specified, on 180. Eggs were used more often than any animal food other than fish. Among green vegetables, swamp cabbage and (2)phag (2)ka-(2)cheed were commonly used. Bamboo shoots and lotus stalks were prominent among the non-leafy vegetables. Bananas which are grown in every garden and are available all year round were much the most common fruit, although other seasonal fruits were eaten more often in 6 of the 9 months in which school children submitted records.

Some idea may be obtained of peak seasons for use of various common foods by noting the months designed by x. Thus in January and May, serpentheads were listed on about 1/3 of the records, and were frequently served at more than one meal. Sweet potato, usually fried and eaten as a snack, was listed on 35 of 52 records obtained from school children in September. Flowers of the West India pea tree were listed on 10 of 55 records in October, and 12 of 88 in November, with occasional mention on records obtained in 4 other months.

Fruits were eaten much less often than one might expect in a tropical area where many varieties are available and fruit can be grown the year round. They were most often eaten by children as snacks, although pineapple and papaya were usually, and banana occasionally cooked in "with-rice" dishes such as curry. In September, fruit was included in the diets of less than 1/3 of the children. An average of more than one serving of fruit per child per day was recorded in 5 months only, May, June, October, November and February. In May, when (4)ma-(1)faj or rambai was in season 46 of 76 children reported having eaten it. Pineapple, listed by 35 of 61 children in June, was most often served in curry at one or more of the family meals. In October, oranges were eaten by 30 of 55 children who submitted records. Bananas (mostly of the (4)nam-(4)waa variety) topped the list in November and February.

Items mentioned on fewer than 10 records, and hence arbitrarily omitted from the chart, are worth noting as they

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1. No figures are given for sweet basil, garlic, onions, chili or limes, which were so often used in small amounts as seasoning that the count obtained would give no clear idea of the extent of their use. Some common spice plants were not mentioned on the records.

might provide clues to ways in which the diet may be improved. Most of these items were included in lists given by Sharp et al. (1953)[1]. To those lists should be added the following items from our food records:

Green leafy and yellow vegetables: Leaves of bergamot, chili, morinda, onion, potato, pumpkin, (2)sa-(5)noo, and of the following trees: (2)ma-(1)dan, (4)khlyb[2] and West Indian pea tree; (2)kha-(1)cauaun flowers.

Other vegetables: flowers of leek and pumpkin, and Chinese or black truffle (water chestnut).

Fruits: Thai nutmeg and tomato.

Fresh foods other than fish: buffalo, duck, cobra, turtle and field rat.

At the end of Chart 2, sources of water for drinking and food preparation have been included, not only because water is properly considered a nutrient, but also because the water used in preparation of food may affect the wholesomeness of foods eaten raw or with little cooking.

Untreated water was the customary beverage with meals. Ordinarily no distinction was made in source of drinking water for children and adults although boiled water was given to mothers and infants to drink during the post partum rest period (Hauck, 1956). Occasionally a sick person would be given boiled water to drink; for example one man who said he was "a little sick" and "not working" was observed to drink hot boiled water from a thermos bottle. In 1955, Ralis[3] found that tea was seldom or never drunk by nearly 3/4 of the respondents. Less than 7% drank it frequently. Thus in Bang Chan no custom had grown up which would afford the general population with a measure of protection against infection from

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1. See Sharp et al., 1953, pp. 193-196 for a list of 32 fish known to be found in Bang Chan; pp. 293-294 for 34 fruits grown in Bang Chan, and p. 295 for 11 fruits known to be used but not grown there; pp. 296-298 for 41 vegetables grown in Bang Chan, and pp. 299-300 for 24 other vegetables used.

2. (4)Khlyb was the term used in Bang Chan for an unidentified tree of the family Leguminosae. Its sweet tasting leaves were washed in boiling water to get rid of a bad odor, then were eaten with (4)nam (4)phrig, a chili sauce.

3. Golden and Ralis, 1957, p. 57. The answers to: "Do you drink tea frequently, occasionally, seldom or never?" were: often, 22; occasionally, 68; seldom, 158; never, 85.

contaminated drinking water, but the traditional use of boiled water for newborn infants and their mothers, and its occasional use for sick persons, might provide the starting point for a desirable change.

Meal Preparation and Service

Processes and Equipment

252 The principal processes involved in food preparation for which equipment was required are: cutting solid food into bite-size pieces, pounding spices and flavoring materials, grating coconut, straining, boiling, sauteing in a small amount of fat, steaming, and roasting on a stick or metal support over the fire. Although foods were steamed or roasted only occasionally, the processes were familiar to all.

358 The Thai kitchen had no oven. When the term "baked" was used, it might mean cooking with dry heat on a rack over the fire (as banana baked in the skin) or without fat in the frying pan (as small dried fish toasted in this way).

128 Equipment used during meal preparation by the 11 families observed on 44 survey days is listed in Appendix A, p. 96, that used in serving and eating food, on p. 96.

252 The type of food preparation and service was much the same in the relatively well-to-do and the poorer households in Bang Chan. The chief difference in equipment for food preparation and service in families of different economic status was in the number of items of one kind which were owned. Thus a poor family might own one knife and one clay water jar, whereas an affluent family would probably own several knives and a number of water jars. Equipment used on special occasions, as in preparation of food for large numbers of people, was owned by well-to-do families only. Some had enough equipment for large cooperative work parties.

Persons Responsible for Food Preparation

252 Food was usually prepared by the homemaker and/or older daughter, if one were at home, but all members of the family who were old enough to help, had some knowledge of food preparation and did prepare food as the occasion demanded. While preparing, cooking and serving food were more frequently carried out by women than by men, adults and school-age children of both sexes had some competence in this area. While certain activities are normally assigned to men and others to women, the Thai maintain no rigid compartmentalization and are unembarrassed when a woman does a man's job or a man does

a woman's" (Sharp et al., 1953, p. 88). For instance, the husband cooked when his wife was away from home, e.g. selling in the market or in farm labor, and of course when she was sick or resting after childbirth. The ability of boys as well as girls to cook rice and some of the accompaniments was taken for granted. A girl or boy could cook rice "as soon as he could lift the rice pot," e.g. at 6 or so; by age 12 he could cook a creditable meal. In mid-December, 1952, on the last day of school before vacation, one of us saw committees of school children (aged 7-14 years) preparing food for a special meal, on the school grounds. The variety of dishes prepared and the ease with which the children went about their tasks gave evidence of the home experience these children had had (Hauck, 1953). Responsibility for food preparation increased with age up to about 15 years, after which all available able-bodied family members did field work during the busy seasons (cf. p. 11). Several hours per day were spent in cooking and by middle age, parents were eager to turn this job over to a daughter or daughter-in-law. If they had no daughter, this was an explicit reason for adopting a baby girl.

Certain men of eminence, e.g. headmen and elders, would not be asked to cook at all, but as they aged, they might return to the task. One old headman, all of whose children had married and left home, said that he was doing the cooking for 2 months because his wife had back trouble. Some dishes were cooked by men only, even when their wives stood by: turtle, frog and cobra curries, for instance. These were also food for men only, suitable to serve at a drinking party.

A premium was put on good cooking, and certain women who were noted for their cooking were in great demand for large scale food preparation during the ceremonial season. One farmer planned to send his daughter to learn from such a skilled cook, having in mind the food preparation which would be needed when his sons were old enough to be ordained. Adverse comments might be made if the food did not come up to expectation; thus, a small boy complained that his curry was "too salty," and an old woman said loudly that the curry made by her 16-year old grand-daughter was "not good," although this girl was the only one at home to cook.

Meal Patterns[1] and Preparation of Typical Thai Dishes

Food was commonly prepared twice a day, in the morning and late afternoon. The meal pattern was the same for breakfast

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1. Suvarnakich (1950) described the Thai diet in a general way and Sharp et al., (1953, pp. 263-274) summarized the small amount of information on diet in Bang Chan obtained during the preliminary study in 1948-49.

252 and dinner, either meal taking an hour or two to prepare.
264 Snacks might be eaten at any time. Adults often ate just the two principal meals, but children, especially the small ones who were not in school, might eat whenever hungry. The school children often purchased snacks from venders on the
[illegible] school grounds. If food was to be offered to the priests,
853 who went around the village about seven o'clock in the morning, breakfast preparation was begun early, between 4:30 and 5:30 a.m., although family members might eat at various times during the morning: the husband before he went to the field, older children, before school time, babies and small children when the mother had time to feed them, and so on (Appendix A, p. 95). Preparation of supper usually took place sometime between 2:30 and 6 p.m. Whenever possible, family members ate together at the evening meal, but many exceptions were noted.

252 Rice is the principal item in every Thai meal. In Thai
262 the general term meaning "to eat" is translated literally "to eat rice." All food items are divided into two classes: - rice and "with rice," or (2)kab (3)khaw. Among the families studied three or four "with-rice" dishes were usually prepared during the day, i.e. for the two main meals, but the number varied in different families, and according to season. One or two of these dishes would usually be "hot" i.e. highly seasoned with fresh or dried chili peppers. Fish was the food item second in importance to rice, but the typical "with rice" preparation, whether hot or mild, contained more than one food item in addition to a variety of spices and flavoring materials (Appendix C, p. 118).

262 Between meal snacks might be any available leftover
264 food,[1] fruit, or items purchased from a vender.[2] Such snacks were not regarded as meals, however, as no Thai considers that he has eaten a meal unless he has eaten liberally of rice.

252 The general method of cooking rice was the same throughout the village. The rice was washed two times in water from the canal or fish pond, and was then boiled in a large volume of unsalted water for about 24 minutes. The rice pot was

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1. Leftover foods from breakfast were eaten later that day with or without reheating. "With-rice" was seldom left over from the evening meal, but rice was frequently kept over night.

252 2. Deep fat frying of bananas, sweet potato slices and
264 the like was commonly observed, both among venders who sold their wares on the school ground, and those who travelled by boat. This method of cooking was never observed in ordinary home food preparation probably because fat was in relatively short supply.

252 usually covered. A common practice was to remove the cover and stir the rice once, toward the end of the cooking process. When the rice was almost done, surplus cooking water was drained off, and often after a lapse of time, the covered pot was put back onto the fire which had been allowed to die down, for about 6 minutes.[1] Thus the final cooking was essentially a process of steaming. Total cooking time varied from a little over 20 minutes to three-quarters of an hour, depending primarily on the amount of rice cooked. The finished product was moist enough to form a ball when pressed between the fingers. Left-over rice, if not eaten cold as a snack, was reheated by being added to the hot rice at the next meal. Rice water was commonly given to pets if there were any. In 4 families which participated in the dietary study, rice water was given to infants, one 11-year old boy served himself liberally to it, and one adult man was observed to drink rice water before meals.

231 212 353

The many recipes for preparation of "with-rice" dishes may be grouped into two categories, hot and mild. Hot dishes always contain chili and varieties of spices which are hot tasting. One type of hot dish is curry which may be designated as either "hot" or "sour". Thai curry consists chiefly of fish or any available kind of meat, with or without vegetables. To make curry, shrimp paste, chili and spices were pounded thoroughly and then mixed with the meat and condiments and frequently with coconut milk. All were boiled together. Vegetables, if used, were added when the mixture was nearly done. Both vegetables and meat were cut into small pieces and washed before cooking. With the exception of dried chilies and tamarind, foods were not ordinarily left to soak in water. Sour curry differs from hot curry in that it contains less chili and spices and has a mixture of tamarind ((4)ma-(1)dan might be substituted) crushed with water added to it.

The other type of hot dish is (4)nam (3)phrig or chili sauce. It is made of shrimp paste, chili, garlic and other spices ground together in the mortar and then mixed with lime juice, sugar and salt or fishsoy. (4)Nam (3)phrig was always served with either raw or cooked vegetables. One informant commented that (4)nam (3)phrig was the everyday food among the villagers.

Preparation of mild dishes varied. These included panned vegetables, meat or eggs cooked with small amount of fat and a variety of spices and condiments including black pepper but not chili. Fish were sometimes roasted or boiled. Vegetables might be eaten either raw or cooked in coconut milk without seasoning. If vegetables were simply boiled in water,

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1. Median times for a series. In 15 instances cooking time before draining ranged from 18 to 38 minutes and rice was steamed from 2 to 12 minutes after draining.

252 cooking water was discarded. In Bang Chan, foods were not usually cooked a long time.

In most village homes, one fire only was built for ordinary meal preparation. Rice was cooked first, then "with-rice" dishes, no attempt being made to serve the rice and accompanying foods hot. Indeed, with the frequent use of chilies, one might have the sensation of eating hot foods, no matter when they were taken from the fire. Notes on the preparation of a meal in one household that participated in the dietary study, are included in Appendix C, p. 119.

Meal Service and Techniques of Eating

264 Food was generally served in the kitchen area. When possible, family members ate together at the evening meal, sitting on the floor, each one old enough to feed himself having a bowl of rice before him. The "with-rice" dishes were placed in the center of the group. Family members helped themselves to portions of the "with-rice," using the right hand to take solid foods, and a serving spoon for fluid foods. Enough rice for a bite was pressed together with the fingers of the right hand, so that grains would not be scattered as the rice was conveyed to the mouth. "With-rice" of semi-fluid consistency was eaten by dipping the ball of rice into it, or more exactly, touching one side of the ball of rice to it. The amount of "with-rice" was generally small, and to take more than one spoonful onto the plate at a time would appear greedy.

264 593 When families did not sit down to eat together, those who ate first were expected to take no more than their share. The wife saw to it that her husband had a liberal serving of the best food available. She also gave generously to the children, holding back, eating last or what was left, herself. In a well-to-do household, where food was ample, the mother would be as well fed as others; in a poor household she might be short-rationed day after day.

When priorities in serving were observed,[1] young children, "not old enough to know better" were not expected to wait until the elders had been served. A frequent pattern at both breakfast and dinner was for older children to feed the younger ones before their own meal; elders in the family then ate, and husband and wife ate together if possible, or as convenient to their separate schedules. In the morning if food was to be offered to priests, family members did not ordinarily eat until after the priests had been served. If necessary, however, the priests' food could be served onto a tray, then others might eat. The observer often had

1. See footnote 1, p. 49.

796 The actual ritual of these ceremonies did not take a great deal of time although it was important. Most of the
[716] time and effort went into preparing and serving food. Even a small celebration involved cooperative effort among relatives
[782] and friends. For every event, the Buddhist altar in the home was decorated and offerings were made to the house-spirit. A
764 big cremation might require planning in detail for years ahead:
796 invitations to priests and relatives in distant parts of the
574 country; hiring an orchestra and obtaining ceremonial gear.
535 For the largest events, when the guest lists ranged upward to
[928] 60 or so priests and 400 other guests, one borrowed the hundreds of trays, dishes and bowls owned by the temple. No rental fee was charged for these, but such items had to be returned the next day, clean, and damaged articles replaced or paid for. As the day or days drew near, boat-loads of fresh provender were bought at big markets, and organized cooperative cooking went on under the direction of a competent person,
[258] usually one of the "professional" cooks of the village. The
[476] day before one ordination, 33 women were seen preparing vegetables, fish and soup; 13 others were making 7 kinds of desserts; about 50 others of both sexes were at different tasks, the men in particular cooking Chinese noodles, grating coconut, stirring, stoking fires. The picture was one of rows of stoves, pots so large they were stirred with a boat paddle, buckets of sugar, eggs by the hundreds, a hired generator to run a mechanical coconut-grater. On this occasion two meals were served. At another splendid (1)ngaan, the priests were fed three meals, other guests up to eight meals, over a period of two and one-half days. Workers had received additional meals beforehand.

[262] The banquet comprised rice and many dishes not met with in daily fare: Chinese noodles; "with-rice" dishes of several kinds, rich in fish, meat and vegetables; for example, fried chicken with internal organs, garlic and pepper; fried pork with mung bean; (2)mii (a fried vermicelli) with fish, vegetables, and a tomato sauce; many different desserts made of eggs, rice flour, glutinous rice, agar, coconut and coconut milk, sugar, sweet potato, dried green beans; flowers served in syrup, fresh fruit such as watermelon; ices and coffee.

128 In Appendix A, p. 102 is a list of foods bought for an
262 annual homage-to-the-teacher rite. It is the nearest approxi-
796 mation to a quantitative record of food for a ceremony that
815 the research group obtained. The prominence of purchased foods, especially of flesh foods, is noteworthy.

264 On the great day, the priests were served first, either
796 at 7 a.m. or 11 a.m., or both, always at least in part by the
792 host, who sat and chatted with them. No one else ate until

In Bang Chan when donations for a new school
264 building warranted buying the foundation materials, so that
476 volunteer labor was solicited for their installation, some of
346 the money went into food, despite additional donations of food. This was in no way misappropriation. Helping to cook was as important as helping to dig the holes.

782 The spirit-offering, or the portions eaten by a partic-
264 ipant as a sacrament, were actually tiny bits of each food. Afterward, the entire lay-out, pork, sweetmeats and all, was eaten. Because all this was holy food, it was felt to be especially strengthening, so was usually given to children, but might be eaten by family members and occasionally, priests.
262 The pork was cut up and eaten with a hot sauce, or put into a
• 262 "with-rice" dish. It was especially appropriate with liquor.

262 The use of food ritually was not limited to the ceremon-
755 ial season nor to big events. The same purposes underlay the
852 use of a hard-boiled egg eaten in the ceremony that was designed to restore a child "sick from temporary loss of its soul," and in another performed in order to wean a baby.

43 The benefits of a (l)ngaan accrued to every participant
554 down to the last worker and contributor according to the degree
796 of assistance. With status in this and in later lives at stake, no one hesitated to plunge into debt or even to sell land. For the sake of economy two different ceremonies might be performed on the same day, for example a child's topknot cutting at a daughter's wedding.[1] The saving was in time and expense for food preparation, but such multiple ceremonies were performed less often than one might expect.

796 One assistance in the financing was that every invited
476 guest made a contribution, customarily 5 to 10 baht, which
435 helped defray the costs. In 1952, household heads reported these contributions as totalling from 30 to 1,000 baht, with an average of 343 for the year (Janlekha, 1955). Of 96 household heads who provided information on special expenses during the 5-year period March, 1948 through February, 1953, 36 had given (l)ngaan with net expenditures (costs minus contributions) ranging from -10[2] to 15,000 baht. The average net cost was 4,361 baht (Janlekha, 1955). These figures might represent a single (l)ngaan or several events.

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1. Every desired ritual could be carried out at little cost. Thus a priest-candidate whose father was dead, was included in the pre-ordination festivities planned for a friend; and on one occasion five bodies were cremated at the same ceremony, which was sponsored by the kin of one of the deceased.

2. The -10 meant that contributions exceeded the cost.

252 One other aspect of (1)ngaan which should be mentioned
796 in connection with food and health is the opportunity for con-
781 tamination of food. The villagers did not associate sanitation
[753] with health, hence the hazards of a community meal which many persons helped to prepare were many. Two incidents observed the day before an ordination in early April, will illustrate. In the final stage of making Chinese noodles, rice flour paste was extruded through a perforated disk into an enormous pot of boiling water. When done, the product was removed with a fish net, and plunged into the canal to cool, after which women helpers spread it out on banana-leaf covered trays. Dishes were also washed before use in the canal, which was then too low for boats. Since, however, many people drank untreated canal water at this season (see p. 28), the added hazards for the participants caused by these procedures may have been slight.

262 In summary, food plays a major role in ceremonies and
792 festivities, which are concentrated in the 3 months' dry season. Proposals for dietary improvement in Bang Chan must take into account not only the possible effects of the (1)ngaan season on the total nutrient intake, and on opportunity for exposure to contaminated food, but also the importance of these affairs from the standpoint of merit and prestige, and the relatively great financial burdens which villagers therefore undertake because of them.

QUANTITATIVE DIETARY STUDY: FOODS EATEN AND ESTIMATED NUTRIENT INTAKE OF SELECTED FAMILIES IN BANG CHAN

Procedure

121 125 146 Selection of the Sample

Medical inspection designed primarily to discover possible signs of nutritional deficiency was carried out in advance of the family dietary study. The suggestion of Grant (1948) that matched groups, of contrasting economic or other status be studied, appeared to be appropriate to the situation in Bang Chan. Our hope was to be able to select from the random sample of families given medical inspection (Hauck, 1956) a group of families (A) in each of which several members had clinical signs which might be evidence of malnutrition, and a group of families similar in age and sex distribution (B) in each of which the members were largely or wholly free from such signs.

125 146 When the medical inspection of the random sample was complete, however, too few of the families were found to meet our criteria for inclusion in Group A, i.e. the group of apparently less well nourished families. Additional families for

[146] Eggs were eaten occasionally; pork and beef were bought in-
[262] frequently and in small amounts by some families. One family only, ate chicken; other meats eaten on survey days included buffalo, frogs, eels and field rats.

Vegetables. - More than three quarters of the estimated vitamin A value of these diets was provided by green and leafy vegetables, although the pale yellow sweet potatoes, eaten in quantity by one family in Group A increased the vitamin A from other vegetables substantially. The greater use of swamp cabbage, a wild aquatic plant by families in Group A, may be explained by the fact that more visits to this group occurred when the water level in the canals was relatively high. Families in Group B, however, used a greater variety
[263] of greens, especially leaves from a number of trees. For families in Group A, sweet basil contributed substantially to the vitamin A and riboflavin content of the diets, whereas families in Group B used this herb in trivial amounts for flavoring. No nutrient values were found for lemongrass, which was used regularly in substantial amounts for flavoring. Persons in Group B got a greater percentage of their calcium and iron from green than from other vegetables, whereas those in Group A obtained as much or more of these nutrients from other vegetables.

Nearly 3/5 of the ascorbic acid intake of Group A was provided by other vegetables as compared to 1/4 from green vegetables, whereas Group B obtained about equal amounts of ascorbic acid from green and other vegetables. Egg plants[1], calabash and white radish were most commonly used in quantity. Onion, garlic and dried chilies were used daily, but in smaller amounts. With the exception of one family which ate a large amount of sweet potato on one survey day, consumption of tubers, i.e. sweet potato and taro, was small and usually in the form of snacks eaten by children. Legumes were seldom eaten in Bang Chan. Two families had bean sprouts on survey days, and children occasionally ate mungbeans and peanuts as snacks.

Fruit. - Although technically a fruit, the coconut does not resemble fruits as a group in its contributions to the diet, hence coconut and other fruits are treated here as two sub-groups. Coconut meat, and its products, coconut milk and coconut cream (Appendix C, p.128), were used almost daily in the participating households. These coconut products contributed about 1/5 of the total fat of the diet, for Group A,

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[244] [252] 1. Many varieties of eggplant are grown in Thailand. Three were used on survey days: the pea-size variety which was frequently put in hot curry, a round type which was served raw with chili sauce and a long variety which was either panned with a small amount of fat or used in curry.

146 For items used less frequently, the figures are correspond-
262 ingly less than the usual amount eaten. Thus, sweet potato, which is represented as 18 grams per day per person in Group A, actually appeared on 3 records only. One family of 8 persons ate 1200 grams of sweet potato at one meal and a substantial amount later the same day. Most items appear on the lists for both groups, but sweet potato, sweet basil and bananas were included on the list for Group A only, and glutinous rice which is used as a sweet in this area, appears on the list for Group B only. Note that a few common foods account for most of the nutrients in the diets of both groups. These common foods account for only about 80% of the calcium and vitamin A value and slightly less of the ascorbic acid in the diets of Group A. The list for Group B accounts for about 70% of the calcium and 60% of the ascorbic acid in the diets of this group. The variety of green leaves used once or twice only on survey days by Group B, and the number of different seasonal fruits used by both groups in small amounts as snacks, probably account for this.

264 Contribution of Snacks to the Nutrient Content of Diets. -
[355] On the average, 4 out of 5 children had one snack per day,
262 whereas only one adult in 6 did so. The following items appeared most commonly: various kinds of fruit, 40 times (orange 7, banana 6, pineapple, watermelon and mango each 5 times, guava, jujube and Manila tamarind each 2 times, olives, rambutan, rambai, star gooseberry, (2)ta-(1)koo and Thai nutmeg each once,) coconut and bread each 13 times, glutinous rice 8, mung bean 7, truffles 6, products made of rice flour 6 times, and a variety of other items including rice noodles, sweet potato, taro, bean sprouts, lotus stalks, lotus seeds, popcorn, products made of cassava flour, sugar cane, pork and milk from 1 to 4 times each. Salt, and/or palm sugar were
[146] eaten with a number of the snacks. Although they contributed only about 2% of the total calories, and from 1 to 3% of most nutrients, snacks contributed 16% of the total ascorbic acid for Group A and 11% for Group B.

Seasonal Variation in Food Preparation, Meal Patterns, Food Costs and Calorie and Nutrient Value of Foods Eaten

128 In Table 14, a summary including the number of meals
• 258 prepared, time spent in meal preparation, number of "with-
264 rice" dishes, and cash expenditures for food is given by
435 rounds, for families in each group.

252 Number of Meals Prepared. - Food was cooked twice on
512 each survey day in 3 of 6 households in Group A and 3 of 5 households in Group B. Heavy farm work or vending which kept the mother away from the house sometimes accounted for once-
[443] a-day food preparation. One housewife who took food to market in Bangkok, cooked food twice a day only during the period shortly before the birth of a child, when she was not vending.

[Text conntinues on page 79 --- Analyst]

Table 14. Summary Concerning Meal Preparation, by Rounds[1] for Two Groups

Description of Items	Group A				
	Round I	Round II	Round III	Round IV	Round I
No. of meals prepared - 2	5	4	4	4	4
- 1	1	2	2	2	1
Range of cooking time, hrs.	0.8-6.0[2]	1.0-2.6	1.3-2.7	1.3-4.0	1.7-3.2
Average cooking time, hrs.	3.7	2.0	1.8	2.4	2.5
Range of no. of dishes prepared	2-8	2-5	1-4	1-4	2-5
Average no. of dishes prepared[3]	5	3	3	3	3
Range of no. of hot dishes	0-3	0-2	0-2	1-3	0-2
Average no. of hot dishes	1	1	1	2	1
Range of no. of mild dishes	2-7	0-3	0-3	0-3	1-3
Average no. of mild dishes	4	2	2	1	2
Range of cash expenditure for meals/day (bahts)[4]	1.53-4.45	0.61-6.30	0.12-4.52	0.66-2.88	0.71-16.24
Average cash expenditure for meals/day (bahts)	3.01	2.96	2.39	1.70	4.85

1. For dates, see Table 7, p. 58.

2. If time waiting for a vender was not counted, the range of cook 0.8-4.1 and the average would be 3.2 hours.

3. "With-rice" dishes only. Rice is always cooked whenever a Thai

4. One baht was equal to 5 cents at the time of studies.

useholds Studied

	Group B	
d	Round III	Round IV
	5 0	3 2
4.1 3.1	2.2-3.3 2.8	1.0-3.2 2.0
2-7	2-6 3	2-5 3
1-2	1-2 1	0-2 1
1-5	1-4 2	1-3 2
- .86	1.12- 4.13	0.45- 3.47
.11	2.61	1.36

time would be

is prepared.

252 262 264 512 [525] Another, who had time during Round IV to prepare food twice a day, preferred to prepare more in the morning when she expected to offer food to her son who had just been ordained. In two instances an evening meal was not prepared because the father and mother had been invited to a feast in connection with an ordination ceremony, on one occasion a mother did not prepare food because she was gambling. In all of these cases, the evening meal at home consisted of leftover rice and other foods prepared earlier. The housewife in Household 215 sometimes received cooked foods from visitors in return for her services as medium, and these were used, together with leftover foods, for the evening meal. The meal patterns of the two groups of families did not appear to differ greatly.

252 Time for Meal Preparation and Number of Dishes Prepared. - In general, the time for meal preparation varied with the number and type of "with-rice" dishes prepared. The "hot" dishes usually required more preparation time than the mild ones, because of the time required to pound spices, and to cut up ingredients. Once-a-day food preparation reduced the time required for cooking. More time was apt to be spent on food preparation when the housewife was least busy with farm work or other work outside the home. Some of the families visited early in Round I had not begun heavy farm work, and in some, children, who were less skilled, did the cooking.

262 435 511 Cost of Food Purchased. - The lowest cash expenditure for food by any household on a survey day was 0.12 baht, for a family in Group A, and the highest 16.24 bahts, for a household in Group B (Table 14, p. 78). On a per capita basis, however, the mean cash expenditure for food by Group A households, for all survey days, was slightly higher than for households in Group B (Table 8, p. 62), and no evidence was obtained that in general households in one group tended to spend more for food than households in the other. Despite the wide variation in cash expenditures for food on the survey days, the tendency for cash expenditures for food to decrease in both groups of households as the survey year progressed was apparent. Most of the rice was sold at the end of Round III. The cash went for capital investments, not food, during Round IV. With time to drain ponds and to fish intensively, and with ceremonies to attend, people did not need to buy fish and meat which were relatively expensive.

262 432 [221]

146 221 [28] Calorie and Nutrient Value of Foods Eaten. - The seasonal variation in calorie and nutrient intake of the two groups of families is shown in Table 15. As one would expect, the average calorie intake was higher during Rounds I and III, when relatively heavy farm work associated with planting and harvesting was under way, than during Round II, which was primarily the growing season for rice, or Round IV, when the harvest was in, and the earth was dry so that preparation for the next planting had not yet begun. Greater consumption of rice in Rounds I and III was largely responsible for the

[Text continues on page 81 --- Analyst]

000 First steps toward a better diet are suggested by the best dietary practices observed. Although the calculated intake of no family on any survey day approximated or exceeded the estimated allowances for all nutrients, sharp contrasts were evident in individual records. Two sample calculations in Appendix C (pp. 121-122) represent one of the better and one of the poorer records obtained. The food for Household 12, on Jan. 14, 1954 consisted chiefly of polished rice, fish, and non-leafy vegetable, with seasonings. In contrast, on July 23, 1953, Household 16 used home-milled rice, and about 60 gm. per person of swamp cabbage, with other vegetables and fish. These choices enhanced the potential nutritive value of the diet markedly without increasing its cash cost. Family labor was involved, however, in gathering greens and milling rice.

000 Since rice is the chief solid food for all ages, improving this major item will be considered first. An important step would be to teach the people to cook rice with just enough water so that all would be absorbed. The Thai government has sought to encourage this. So long as the practice of cooking rice in excess water persists, much of its vitamin and mineral content will be discarded, and efforts to improve the nutrient content of rice will be largely nullified. Some rice water could be used as a beverage, and for cooking certain vegetables which are commonly served with a thickened sauce. This would be preferable to discarding the rice water, but encouraging its use must be considered as an alternative to cooking rice without excess water, since the two practices are mutually exclusive.

Use of under-milled and processed rice, and of the rice polishings, has the advantage that a large part of the original B-complex content is conserved, whereas vitamins for enrichment are at present imported, and are apt to be for years to come. Since home milling persisted to some extent in Bang Chan, it might be encouraged, in some families. One highly respected headman continued to mill rice at home, hence the "prestige value" of white rice may not be so important in Bang Chan as it is among city Thai, who sometimes regard undermilled rice as "prisoner's food." The time and effort involved in home milling, however, may deter those who have given it up from returning to it; and since deepening the main canal has made the mill accessible to more families the year round, a program based on the assumption that commercial milling of rice will increase is probably more realistic than an attempt to encourage the return to home milling where it has been abandoned.

256 At present, no processed rice is made in Thailand. A plan to buy and install a Malekizing plant to process rice for the Royal Thai Navy was announced in 1953, but the plan has not materialized. Enriched rice has been sold by the Thai Rice Company for some years, but the best grades only,

APPENDIX A

Description of the Kitchen and Some Notes on Food Preparation in a Relatively Prosperous Household[1]

Friday, May 22, 1953

Arrived at 5:15 a.m. When we reached the house, the mother was holding the dog. The house was dark, and we walked around sleeping babies and children. . . . . The 15 year old niece who prepares meals here, was already at work. For light she had an oil lamp, a tin of about 1 pt. capacity, with wick. The rice was already measured, but she waited until SS could weigh it, before putting it on to cook. SS used her flashlight to see the scale and her notebook.

The kitchen here has a thatched roof, well smoked, but the walls and "windows" are of woven split bamboo. A sliding wooden "window" can be pushed back to allow access to a broad shelf outside. Here a large pan of pond water is kept, so that dishes may be rinsed and hands rinsed after each operation. Dishes are stacked upside down, on a wooden rack nearby, to dry.

The stove area in the corner has place for one fire, but several places for pots to stand. Downstairs, under the shed near the fish pond, is a larger clay stove, where the niece cooks the rice in the morning (enough for noon as well) and some other items; for example the (3)khii-(2)leg leaves which were cooked last night for use in sour curry this a.m. This probably keeps the kitchen cooler than it would otherwise be. Waste, fish bones, vegetable parings, etc., which are to be given to the chickens, can be thrown below through the space between two floor levels (kitchen and main rooms).

Rice water, coconut water, and food left in the serving bowls when the meal is over, are given to the dogs. A bowl is kept below, near where rice is drained, for dog food. Food left in pots is kept for humans to eat.

Fish caught in the pond are kept alive in pond water, in a water jar. When a fish is wanted, the niece catches one from the jar, stuns it with the back of her knife, and scales and cleans it on a split log nearby (rounded side of log up). The fish is put into a small basket, and the niece

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1. In reproducing these notes, slight changes have been made such as substitution of descriptive terms for personal names which appeared in the original.

94

117 takes it down the steps to the fish pond, where she swishes
252 the basket around to wash the fish, and rinses her hands at the same time.

[231] There are some hazards to the food--chickens trying to get at the edible part of fish while the niece cleans it (she leaves the scales, etc. for them to eat); cat and kittens in the kitchen, having to be driven away from the grated coconut and coconut milk, and getting an occasional unweighed nip. Whether we start to weigh food for the evening meal or a.m. meal, some cooked foods are apt to be used, either left over [262] from a previous meal, or cooked in advance. This a.m., for [126] example, buffalo meat, already cooked (but not weighed before cooking) was used, and (3)khii-(2)lag leaves, which SS weighed last night. These latter were cooked last night, to reduce bitterness, then put into curry today.

Description of Food Preparation Area in a Relatively Poor Household

Wednesday, May 27, 1953

117 [262] Arrived about 5:45 a.m. While other food was being prepared, the 11-year old son came in with a package of salted white radish and a small milk tin with some coconut oil which had just been bought. This is the house which we found flooded when they sent for us to see the baby last fall. The roof seems to be well thatched. The floor is not wet after last [352] night's downpour. The bed platform, in one corner, is about [354] 8 x 10 feet. The baby's cradle hangs above it. In the oppo- [352] site corner is a shelf where utensils are kept. Some food, [251] in paper bags, is in a basket hung from the roof. Fresh fish [359] is kept in a jar of water until needed. The stove is on a small mound of earth, and further elevated on a small box (just big enough for the stove) filled with earth.

[352] We sit on a mat, spread on the mud floor, with the scales, plastic bowls and waxed paper ready for weighing food. [355] The children lie on a mat nearby. In the house is a fresh mound of earth, a small straw bin with rice, and various pieces of equipment.

Equipment Used For Food Preparation

252 41 [251] Equipment used for food preparation by 11 families participating in the dietary study: clay stove; pots and covers of clay, light weight aluminum, and enameled iron; frying pans, curved, of sheet iron, with home-made wooden handle on one side, or metal handles on opposite sides (shallow clay pans were also used for frying); basins, pails, chopping boards; grater for coconut: a metal, toothed instrument mounted on one end of a low wooden stool (often called a "wooden rabbit" because the seat of the stool might be shaped like a rabbit); mortar of pottery or stone; wooden pestle; fiber strainers usually with rigid handles, to hold them in place on top of a pot; a large-bladed all-purpose knife; in some households, one or more smaller knives; metal turner, with home-made wooden handle; spoons, with bowls of coconut shell, gourd or wood; tin cans for dipping, measuring rice, etc.; fiber trays used for winnowing rice, for drying food, storing dried chilies, onions, etc.; metal tray for serving food to priests, and for household use; baskets for storing food; (5)faa-(1)chii, or fiber cover, to keep flies and insects off cooked food; large earthenware water jars.

[184] Other items less often used, and owned by relatively few families in Bang Chan, included: steamer; a perforated clay pot or metal pan with cover, designed to fit tightly into another pot in which water was boiled; large wooden mortar, made of a hollowed tree trunk; spring-type egg beater (a strong spiral spring attached to a stick); scale; glass water jars.

Equipment Used in Serving Food and Eating

269 412 415 The equipment for serving and eating food might include: flat bottomed bowls with a deep edge, similar to Western-style soup plates, used as individual rice bowls; plates; small bowls for "with-rice" dishes; sauce dishes with stand, for chili sauce; enameled iron or china spoons (Chinese type) used for serving moist foods; forks, used by some families on special occasions;[1] teapot and cups; large rice bowl for ceremonial use (silver or aluminum); large brass spoon with serpent-tail handle, for serving rice; drinking glasses; tiered lunch pail; canteen; thermos bottle.

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1. A relatively poor family (Sharp et al. 1953, p. 223) had one pair of fork and spoon for eating.

Food Preparation and Consumption — Sept. 25, 1953 — Household No. 21

Menu 1	Raw Ingredients: Kind 2	Wt. A.P. 3	Cost 4: Bt.	Cost 4: Stg.	Ined. Ref. 5	E.P. 6	Cooked Foods: Dish 7	Dish + Food 8	Food 9
Meal Time 4:30 a.m.		2180-800					800	2990	2190
		= 1380					120	1280	1160
Cooked rice	Polished						190	850	660
									4010T[1]
(1) Banaun stew	(leftover)						450	915	465
(2) Sa-(5)noo stew	Coconut meat (to make milk)	700-180 = 520		50		520			
	Dried chilies	24		15		24			
	Onion	8		4		8			
	Galangal (HG)[2]	8				8			
	Garlic	4		2		4			
	Lemongrass (HG)	12				12			
	Bergamot rind (G)[2]	4				4	490	1390	940
	Salt	30				30	130	312	182
	Serpenthead (C)[2]	320-120=200				200	130	300	170
	Shrimp paste	6		3		6	130	260	130
									1422T
	(2)Sa-(5)noo flowers (G)	550			580-520 = 60	640-150 = 490			
	Coconut milk					1220-450 = 770			
	Palm sugar	240-200= 40		24		40			
Cooked rice	(leftover)						520	800	280
Fried duck egg	1 Duck egg	76			21	240-185 = 55			
	Coconut oil	16		8		16			
	Onion	4		2		4			
	Fishsoy	10		5		10	180	260	80

1. T equals total weight.
2. HG, G and C stand for home grown, gathered and caught, respectively.

2nd Heath et al. B.E.S (1952-1954) 1958 AO7 Central Thai AO7 Bang Chan

125 252 262 264

Use of Cooked Foods						
Given away 10	Fed to Stock 11	Ed. Waste 12	Left Over 13	Eaten 14	Persons Eating 15	Method of Preparation
Cooked rice 890-190=660 (to 3 priests)			0	3350	4	Rice, 4:30 a.m. She washes rice two times and lights the fire. Then she puts rice pot on fire at 4:35. Rice water is drained off at 5:00. Rice pot is put on fire again from 5:15 to 5:25.
			(1)Bauaun stew (leftover) 0	465		(1)Bauaun stew is reheated from 5:00 to 5:15 a.m.
(2)Sa-(5)noo stew 312-130=182 300-130=170 260-130=130 482T (to 3 priests)			0	960		(2)Sa-(5)noo stew, 5:20 a.m. Dried chilies (after soaking in water for a while), onion, garlic, galangal, lemongrass, berganot rind, and salt all pounded together. 5:25 She crushes coconut meat with water five times over colander. Shrimp paste is mixed with (4)nam (4)phrig at 5:40. The pot of coconut milk is put on fire at 5:42. (4)Nam (4)phrig is mixed with boiled coconut milk at 5:55. Fish is put into the pot and water from crushed tamarind at 6:00, (2)sa-(5)noo flowers at 6:05. The pot is put down at 6:12 a.m.
			Cooked rice (leftover) 0	280		
			Fried duck egg 0	80		Fried duck egg. The pan is put on fire at 6:15 a.m. Duck egg is mixed with pieces of onion and fishsoy. Coconut oil is put into the pan at 6:20. Stirred egg is fried from 6:20 to 6:25.

2: Hauck et al. D,E-5 (1952-1954) 1956 AO7 Central Thai AO7 Bang Chan

[illegible] 262 [illegible] 425

K. Snacks

Person eating 1	Time 2	Kind and description 3	Weight (or approx. wt.) A.P. 4	Ined. ref. 5	E.P. 6	Cost 7 Bt.	Stg.
June 4/53			g.	g.	g.		
Girl, 8 yrs.	12:00m	She ate a half fruit of pineapple at home. It was bought from the selling boat.	(375)	(195)	(180)		20
June 5/53							
Girl, 8 yrs. Boy, 10 yrs. Girl, 13 yrs.	All day	7:40 - The pot of truffles (gathered from the fields) is put on fire. It is boiled with water and salt. Truffles: 525-72 = 453 gm. Salt: 35 gm. It is finished at 8:28.	453				
Boy, 10 yrs.	8:46	He eats boiled banana (NC)	48				
Girl, 13 yrs.	Early a.m.	She drinks coffee which is bought from the store near the Wat.					40
Father	10:13	He drinks one glass of milk which is bought from the store near Wat.					50

2: Haack et al. D.E-3 (1952-1954) 1958 AOT Central Thai AOT Bang Chan

NOTES ON THE PREPARATION AND NUTRITIVE VALUE OF COCONUT MILK AND COCONUT CREAM

The term coconut cream ((5)hua (2)ka-(4)thi), as it was used in Thailand, referred to the product which was made by squeezing grated coconut with little or no addition of water. Coconut milk ((4)naam (2)ka-(4)thi) was made by squeezing grated cocomut repeatedly with water. Coconut cream might be made first, and the residue extracted one or more additional times to obtain coconut milk. The terms coconut milk and coconut cream apparently are not used consistently. Losee (1952) commented on this when he described the preparation of coconut cream in Samoa, and said that it was sometimes called coconut milk. Miller et al. (1936), in describing the preparation of coconut milk said "If a thick coconut milk to serve over puddings, taro leaves, etc. is desired, 1/2 to 3/4 cup of coconut water or boiling water should be poured over 3 cups of grated coconut. . . . If the milk is to be used in curry sauce for chicken, eggs, shrimps, or in cornstarch pudding, a larger quantity of water (1 to 2 cups of water to 3 cups of grated coconut) may be used."

In carrying out the dietary study, the observer weighed the grated coconut meat, the residue and the final products, coconut milk or cream, or both. She did not weigh the water as it was added in successive portions, but the amount of added water could be calculated.

The ratio of coconut milk to meat varied considerably, but on the average, households in Group A obtained coconut milk which weighed more than eight times as much as the coconut meat from which it was made. Households in Group B obtained less than 2½ times as much milk by weight as coconut meat. The number of extractions made varied from 2 to 6, with a mode of 3. Obviously, the products made by Groups A and B, although both called coconut milk, had markably different percentage composition, and neither was similar to "coconut milk" for which values could be found. These values were as follows:

Authors	Location	Coconut milk grams per 100 gm. E. P. Prot	Fat	Carbo.
Bocobo et al.	Philippine Islands	3.6	33.2	38.4
Food and Drug Division	Thailand	3.52	34.75	1.52
Miller et al.	Hawaii	4.0	27.0	18.91

1. Personal communication

A small, rather flavorless banana was given to young babies, 853
sometimes before they were put to the breast. This type of
banana and soupy rice were the only supplementary foods given
before 6 months of age. Protein-rich foods, chiefly fish and
egg, were generally introduced in small amounts during the second
half of the first year. Few infants were given vegetables
before one year of age, and even then none had them daily. At
two years of age, some children had not yet been given green
vegetables. Late introduction of vegetables into the child's
diet may be due to the fact that vegetables were often prepared
as hot curries which were considered unsuitable for young children.

A child was usually allowed foods commonly eaten by adults
by the time he was weaned, although a few informants specified
that the child could have anything but "hot tasting" foods, i.e.
foods containing chili. A minority of informants mentioned
other foods as not good for younger babies.

Except for dietary restrictions while the mother was lying 846
by the fire, postpartum, no well established dietary taboos 853
connected with the feeding of mothers or babies were encountered. 262
The concept that a good choice of food is important to the health
of both mother and child seemed to be entirely lacking.

Many of the young children in Bang Chan failed to gain, or 145
even lost, weight in the intervals between observations. Almost
all infants appeared to gain steadily up to 6 months of age,
but stationary weight or weight loss for periods of from 1 to 7
months was observed in most children at some time. These periods
were noted more frequently among children from 2 to 3 years old
than among younger ones. Such experiences were not more common
after weaning than at other times, but the cause or causes of
growth failure could not be determined from the information
available.

Some approaches to improvement in the diet of Thai mothers 252
and children are suggested. Improvement in the diets of mothers
and small children would probably parallel any improvement in
the general family dietary, since food is prepared at one time
for all members of the family.

but additions of rice water, coconut milk, and salt[1] were more common from 3 to 6 months. A few infants less than 6 months old were given rice from the family pot cooked in the usual manner.[2] No other foods were introduced before 6 months of age.

A majority of infants from 6 to 8 1/2 months[3] of age were given ordinary rice, although for some, excess water was not drained off and special mashed soupy rice was still given to others. Fishsoy, (4)nam (1)plaa, might be added for both salt and flavor. Several mothers said that when the baby had teeth he could begin to eat ordinary rice. At this time also the infant was given some other items which were considered as adult food (Table 2).[4] A few were fed protein-rich foods, i.e. fresh, dried, or salted fish, egg, meat, or poultry, between the sixth and ninth months. One child in this age group was given banana other than (3)kluaj (4)nam-(4)waa (kind not specified), and four infants had fruit other than banana frequently or occasionally. Orange, mango, guava, roseapple, and rambutan were mentioned according to season. Some kinds of (2)kha-(5)nom, which included purchased crackers, biscuits, or cookies as well as some sweet items which we would call desserts,[4] were given also, at least occasionally, to many babies over 6 months of age.

Among infants from 9 to 11 1/2 months of age increasing use of protein-rich foods, primarily fish and egg, was noted. Fruits other than the small (4)nam-(4)waa banana and (2)kha-(5)nom were also given to more infants. A few were given vegetables before one year of age, but none had them daily (Table 3).

Diet During the Second Year of Life.

For most of these babies breast feeding was continued into the second year. By this time almost all were given ordinary rice, and more than half had fish daily with fresh fish being fed more often than dried or salted fish. A few babies between

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1. In Thailand rice is not salted during cooking.

2. See (3)khaaw (5)suaj, glossary p. 51.

3. The nearest half month marked the dividing point between age groups. Thus an infant 8 months 20 days old would be considered as 8 1/2 months old and one 8 months 23 days old would be considered as 9 months old.

4. Neither such (2)kha-(5)nom nor fruit were included in the usual family meals, but school children often bought them as snacks to eat at noon recess (Hauck et al., 1958; Hauck and Hanks, 1959).

[1] [see p. 19- Analysis] [3] [see p. 20- Analysis]

853 3 and 6 months soupy rice was a common addition to the infant's diet, and after the first teeth appeared many had rice from the family pot. Between 6 and 9 months, also, fish was given regularly to many babies and egg at least occasionally. Crackers, cookies, and various items designated as (2)kha-(5)nom were frequent additions at this age.

863 Seasonal fruit such as mango and orange was given to some
855 infants from 6 months on, but most children had fruits other
262 than the (4)nam-(4)wa banana infrequently even at two years of age. As the feeding of rice increased, banana was given less often, so that for the 2-year old child even banana was eaten only occasionally. A minority of babies were fed vegetables by one year of age, and some had not begun to eat them by two years. Only about half the children from 2 to 4 1/2 years old had vegetables frequently.

Avoidance of hot tastes, rather than reluctance to give vegetables, may have been responsible for late introduction of vegetables into the diet of many children. In Bang Chan vege-
• [252] tables were often combined with other foods, as in curries. They were usually added toward the end of the cooking time after the mixture had been seasoned. Vegetables from such a "hot dish" would not be offered to a small child unless the parents considered him old enough to eat "hot-tasting" foods. Among the mild "with-rice" dishes were vegetables panned with a small amount of fat and seasonings other than chili, as well as vegetables cooked in coconut milk or in water (Hauck et al., 1958; Hauck and Hanks, 1959). In this connection the suggestion of a Thai co-worker that one might encourage eating more vegetables by discouraging the use of "hot" dishes seems promising, since a larger amount of mild than of "hot" "with-rice" food is eaten at one time. To promote more frequent, and earlier, feeding of vegetables to babies, one would need to encourage either more frequent preparation of mild "with-rice" dishes containing vegetables or special preparations of vegetables for the baby. The latter is rather impractical when foods are cooked one at a time over the same fire as in Bang Chan.

[252] Perhaps one reason why most infants in Bang Chan had fish
[263] daily after 6 or 7 months of age is that in making curries fish was often cooked in a little fat or coconut milk before seasonings were added. Thus, a little fish could then be set aside for the baby before chili and other spices went into the pot. (Note, also, that rice and fish were the foods considered safe to eat
121 during (3)juu (1)faj by all mothers interviewed). Changes in
262 food preparation suggested for improvement of the family diet in general (Hauck, 1958) could automatically help to improve the feeding of young children who are gradually introduced to adult foods. At the same time, a better family diet would probably help to improve the quality and quantity of mother's milk, since during lactation mothers tended to eat as usual. In deciding whether the more effective approach would be through teaching